

WISHA REGIONAL DIRECTIVE

WISHA Services

Department of Labor and Industries

10.10

INDOOR AIR QUALITY

Date Issued: January 21, 2000

I. Background

The number of inquiries to state and federal agencies requesting information and assistance on health and comfort concerns related to indoor air quality (IAQ) has increased dramatically over the last few years. For example, NIOSH has conducted more than 600 IAQ investigations in office (non-industrial, non-residential) buildings under the Health Hazard Evaluation Program since 1991. However, given WISHA's desire to focus its limited resources on the most hazardous industries and occupations, it is critically important to use a decision-making process to evaluate whether or not there are reasonable grounds to believe that a serious hazard may exist. This document establishes such a process, provides examples of serious and non-serious hazards, and provides guidelines on appropriate responses to workplace IAQ complaints. The federal Occupational Safety and Health Administration (OSHA) has provided similar guidance in CPL 2-2, which was issued in October of 1990. WISHA has previously addressed the issue in WISHA Regional Directive 92-2.

Good indoor air quality is an important component of a healthy and comfortable indoor environment. The definition of good indoor air quality includes:

- Introduction and distribution of adequate ventilation air,
- Control of airborne contaminants, and
- Maintenance of acceptable temperature and relative humidity.

Although the focus of this WRD is on control of airborne contaminants, a vital role is played by ventilation, temperature, and humidity. Their importance in productivity, comfort, and a sense of health and well being among building occupants should not be underestimated. It is also important to remember that factors such as noise, lighting, ergonomic stressors (work station and task design), and job-related psychological stressors can – individually and in combination – contribute to IAQ-related complaints.

The greatest challenge posed by IAQ investigations is that the reported symptoms and health complaints are generally diverse and usually not suggestive of any particular medical diagnosis or readily associated with a causative agent. A typical spectrum of symptoms includes headaches, unusual fatigue, itching or burning eyes, skin irritation, nasal congestion, dry or irritated throats, and other respiratory irritations. Typically, the workplace environment is implicated because workers report that their symptoms lessen or cease once they leave the workplace. In such cases, however, it is often difficult to prove a WISHA violation.

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However, in some instances specific illnesses can be associated with identifiable exposures in the indoor environment and employers may be subject to a WISHA citation. Examples of such illnesses include Legionnaires disease, histoplasmosis, carbon monoxide poisoning, and certain allergic reactions associated with exposure to molds.

II. Scope and Application:

This WISHA Regional Directive (WRD) establishes a policy for handling complaints regarding (IAQ) problems and provides guidelines to be used when evaluating IAQ concerns. It applies whenever WISHA consultation or enforcement staff evaluate workplace hazards relating to IAQ in office buildings. It updates, replaces, and rescinds WRD 92-2, and it will remain in effect indefinitely.

III. IAQ Complaint Evaluation Guidelines

In general, how should IAQ concerns be evaluated before assignments are made?

Historically, few IAQ investigations have resulted in WISHA violations. Therefore, it is critical that the evaluating IH carefully evaluate each complaint or other request prior to committing staff resources to determine:

- the potential for identifying specific causative agent(s),
- the likelihood of an exposure pathway existing between the contaminated materials or sources and the building occupants, and
- the specificity and severity of the specific symptoms or illnesses reported.

(see Attachment C, Decision Tree for conducting Indoor Air Quality Inspections)

IV. WISHA Compliance Protocols

How should enforcement staff address IAQ complaints?

- A. Enforcement staff must carefully evaluate all IAQ complaints. The evaluating IH must exercise professional judgment in deciding whether there are reasonable grounds to believe a serious violation can be documented.
- B. An investigation will normally be conducted when a serious or potentially serious hazard is suspected *and* a violation of a WISHA standard (including a violation of the “safe place” or “management responsibility” standards) may exist. IAQ evaluation procedures found in this WRD are supplemented in section 2.2 of the WISHA Technical Manual.

Examples of IAQ problems that normally indicate a serious hazard may exist include the following:

- Complaints of headaches, nausea, lethargy, and/or dizziness (especially if onset was sudden and/or severe) and carbon monoxide poisoning from combustion sources is suspected.
- Complaints of fever/chills and fatigue, or cough and shortness of breath (especially severe, or widespread complaints), other symptoms, or physician diagnosed disease (for example, Legionnaires’ Disease, histoplasmosis) consistent with exposure to airborne microorganisms (see Appendix A).

- Wheezing or other indications where chemicals are present that might prompt or aggravate asthma in a worker.
 - Complaints of significant mold growth within a building (see Appendix A).
- C. Letters to employers may be sent for other types of complaint allegations in accordance with I.C.9. of the WISHA Compliance Manual.

Examples of IAQ problems that normally will be addressed by a letter with recommendations and appropriate resource material (see VIII) include the following:

- Non-specific health symptoms (for example, headaches, eye irritation, fatigue) shared by a group of employees who associate their problems with the building but no source of biological or chemical contamination has been identified or alleged. Recommend that a qualified person inspect the heating, ventilation, and air conditioning (HVAC) system for proper air supply and distribution throughout the area where the complaints were received. Recommend an outdoor air supply rate of 20 cfm per person in all occupied areas or as otherwise specified in ASHRAE (American Society of Heating, Refrigerating and Air Conditioning Engineers).
 - Respiratory or eye irritation reported by employees after remodeling activities or installation of new carpets/furnishings. Recommend the employer increase outdoor air supply to the area and perform remodeling work after regular work hours.
 - Allergic reactions from biological contamination within the building are suspected by employees, but no significant water damage or mold contamination was reported or can be identified as a possible agent. Recommend that a qualified person search for moisture or water damage and promptly remove or clean these materials/areas using appropriate protective measures. Regular maintenance procedures should be also be recommended to identify and eliminate situations where moisture could promote biological growth (EPA guidelines exist for large buildings - see III.H., Reference Materials).
- D. Investigations will not be initiated over issues of comfort, and such issues normally will not result in a letter to the employer.

V. WISHA Consultation Activities

How should consultation staff address requests for assistance involving IAQ?

Consultation staff should rely on the guidance provided in Section IV above and on overall guidance regarding consultation priorities when determining whether to schedule an on-site visit. Such a visit should be scheduled when a consultant determines a serious hazard may exist, but would not typically be provided when a consultant determines a serious hazard is not likely to be documented.

If no visit is scheduled, the consultant is expected to provide the employer with appropriate resource material to assist the employer in resolving an issue (see guidance in IV-C above).

VI. Violation Policy

How should WISHA staff document violations related to IAQ?

- A. The WISHA Compliance Manual, (Chapter IV, Section B.2.c.) must be followed whenever citations, including safe place citations (WAC 296-24-073), are issued.
- B. Most IAQ hazards are not covered by specific WISHA standards. Those that could apply, depending on the hazard, include hazard communication, accident prevention programs, safety and health committee, air contaminants, and the safe place standard.

***Note:** Environmental tobacco smoke (ETS) is not covered by this WRD, but is a recognized hazard covered under WAC 296-62-12000, Environmental Tobacco Smoke in Office Environments.*

- C. The American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE), Illuminating Engineering Society of North America (IES), and other such organizations publish advisory standards and codes which are voluntary consensus standards. These standards are usually based on the combined consideration of “comfort” and avoidance of adverse health effects.
- D. Assistance in evaluating potential violations involving IAQ issues may be obtained from WISHA Policy and Technical Services.

VII. IMIS Reporting Requirements

A. How should IAQ inspections be recorded on the IMIS paperwork?

The inspector must complete the WISHA-1 form (as shown below) when an inspection is made to evaluate an IAQ problem. Under Item 42, Optional Information, enter:

- “S” in the “Type” box,
- “3” in the “ID” box, and
- “IAQ” in the “Value” box.

B. How should IAQ consultations be recorded on the IMIS paperwork?

The consultant must complete the WISHA 20, 30 and 40 forms when a consultation is made to evaluate an IAQ issue. On the WISHA 30, the following information should be entered under Item 22, Optional Information:

- “P” in the “Type” box,
- “6” in the “ID” box, and
- “IAQ” in the “Value” box.

VIII. Reference Materials

- *Building Air Quality: A Guide for Building Owners and Facility Managers** – EPA, 1998. Indoor Air Quality Information Clearinghouse, P.O. Box 37133, Washington, D.C. 20013-7133; 1-800-438-4318; <http://www.epa.gov/iaq>.
- *An Office Building Occupant's Guide to Indoor Air Quality** – EPA 1997. Indoor Air Quality Information Clearinghouse, P.O. Box 37133, Washington, D.C. 20013-7133; 1-800-438-4318; <http://www.epa.gov/iaq>.
- *Building Air Quality Action Plan** – EPA/NIOSH – 1998. Indoor Air Quality Information Clearinghouse, P.O. Box 37133, Washington, D.C. 20013-7133; 1-800-438-4318; <http://www.epa.gov/iaq>.
- *IAQ Tools for Schools Action Kit** – EPA et. al 1995. Indoor Air Quality Information Clearinghouse, P.O. Box 37133, Washington, D.C. 20013-7133; 1-800-438-4318; <http://www.epa.gov/iaq>.
- *School Indoor Air Quality Best Management Practices Manual* – Washington Department of Health-1995; <http://www.doh.wa.gov/publicat/publications.htm>.
- *Bioaerosols: Assessment and Control* – ACGIH 1999. ACGIH, 13300 Kemper Meadow Drive, Cincinnati, OH 45240-2020; <http://www.acgih.org>.
- *Ventilation for Acceptable Indoor Air Quality* – American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 62 – 1989. ASHRAE, 1791 Tullie Circle NE, Atlanta, GA 30329.
- *WISHA IAQ Website* at <http://www.wa.gov/lni/wisha/technical/iaq>.

* Available online.

Approved: _____

Michael Wood, Senior Program Manager
WISHA Policy & Technical Services

For further information about this or other WISHA Regional Directives, you may contact WISHA Policy & Technical Services at P.O. Box 44648, Olympia, WA 98504-4648 -- or by telephone at (360)902-5503. You may also review policy information on the WISHA Website (www.lni.wa.gov/wisha/).

Appendix A

EVALUATING MICROBIOLOGICAL CONTAMINATION

Further investigation of a potentially serious hazard may be appropriate if all three of the following criteria are met:

- A Source: The building is significantly water damaged, contaminated with molds, or reservoirs of other microorganisms (*e.g., Histoplasma, Legionella*) exist;
- An Exposure Pathway: An exposure pathway is likely; *and*
- Illness and Symptoms: A physician has diagnosed a building-related illness or building occupants are suffering from symptoms consistent with exposure to the potential source.

Evaluating the Source

A serious hazard can only be determined to exist if the workplace exhibits one of the potential sources of microbiological contamination listed in the attached Table A-1. Consideration should be made of the possible extent of contamination. Small areas of contamination (*i.e.*, traces of mold on a wall or ceiling tile) may not necessarily warrant classification as a serious hazard (although it may a superficial indicator of hidden problems), as opposed to a contaminated air plenum or an extensively water-damaged wall.

Normally, mold contamination is easily recognizable due to moldy odors and their unique visual characteristics. If it is necessary to confirm the presence of molds at the source, it may be appropriate to take “Scotch tape” samples of the affected area (see Appendix B for more details).

Other specialized sampling may be required if *Legionella* or any other pathogenic (disease-causing) microorganism is suspected. Contact P&TS for assistance.

Evaluating the Potential for an Exposure Pathway


Bioaerosol sampling has been used by many investigators to demonstrate the existence of exposure pathways. However, the numerous technical limitations and difficulties associated with this method make the sampling results extremely difficult to interpret. In general, bioaerosol sampling should not be performed, unless there are special circumstances that warrant this approach.

The IH should qualitatively evaluate factors such as the magnitude and proximity of the contaminated materials and potential exposure pathways. See Table A-1 (in Appendix A) for potential sources and pathways for consideration.

Evaluating Illnesses and Symptoms

Examples of illnesses and symptoms consistent with exposure to molds and other microorganisms are indicated below. The IH must recognize that many of the listed symptoms are relatively common complaints and are not necessarily reflective of a workplace exposure or serious illness.

Physician-diagnosed illnesses associated with microbial contamination include:

- allergic rhinitis or sinusitis
- new-onset asthma
- hypersensitivity pneumonitis 
- pneumonia
- fever/flu-like illness
- recurrent airborne infections

Symptoms associated with microbial contamination include:

- dry, irritated or sore throat
- wheezing
- difficulty breathing or shortness of breath
- chronic postnasal drip
- chronic cough
- continual throat clearing
- frontal headaches or facial pain that increases with bending over or straining
- eustachian tube dysfunction (ear pain)
- altered hearing, smell and/or taste
- recurrent fevers or chills in addition to general malaise and muscle aches

Examples of Microbiological IAQ Evaluation Determinations

The following examples may assist evaluating compliance or consultation industrial hygienists determine the disposition of typical employee or employer generated complaints or referrals (Employee generated complaints are enforcement issues that may result in an inspection, while employer generated complaints are consultation issues that may result in a consultation visit).

Example 1 – Triggers an inspection or consultation visit

The Complaint: A complainant reports that a physician has diagnosed new-onset asthma in a worker whose workspace has evidence of chronic water damage, including several stained ceiling tiles and water-stained walls.

Employee complaint: The complaint results in a compliance inspection *if* there is also an apparent or alleged failure on the part of the employer to take appropriate steps to address the issue.

Employer complaint: The complaint results in a consultation visit.

Example 2 – Triggers an inspection or consultation visit

The Complaint: A complainant reports that several workers are no longer able to tolerate working in a building. As soon as they come to work, they start to suffer from a variety of allergic-type symptoms (sneezing, coughing, and headaches). The roof has been leaking for years and there is evidence of water damage in their workspace – carpets are periodically soaked and ceiling tiles are stained.

Employee complaint: The complaint results in a compliance inspection *if* there is also an apparent or alleged failure on the part of the employer to take appropriate steps to address the issue.

Employer complaint: The complaint results in a consultation visit.

Example 3 – Write a letter and possibly recommend a qualified independent IH contractor (See WISHA Compliance Manual I.C.9.)

The Complaint: A complainant reports that workers are suffering from a variety of allergic-type symptoms, but there is no evidence of water intrusion, water damage, or microbial growth in the building.

Employee complaint: Compliance generates a letter (with appropriate information and resource material) to the employer.

Employer complaint: Consultation sends appropriate information and resource material to the employer. No letter is required.

Example 4 – No inspection or consultation visit, but possibly recommend use of a qualified independent IH consultant

The Complaint: A complainant reports that workers are not feeling well in their building. There are reports of headaches, metallic taste in the mouth, and muscle aches, but there are no objective symptoms that can be verified and no evidence of water intrusion, water damage, or microbial growth in the building.

Employee complaint: Compliance generates a letter (with appropriate information and resource material) to the employer.

Employer complaint: Consultation sends appropriate information and resource material to the employer. No letter is required.

Table A-1

<p align="center">Potential Sources of Biological Agents or Bioaerosol Entry Routes into Buildings and Factors Related to Microbial Growth or Bioaerosol Dissemination</p>

HVAC System

Source/Route	Related Factors
<u>Outdoor air intakes (OAIs)</u>	Bioaerosol sources near OAIs (e.g., plant debris, feathers and bird droppings, insect or rodent infestations, sanitary air vents, cooling towers or evaporative condensers, standing water); below-grade OAIs
<u>Filters</u>	Dampness; microbial growth on filters; gaps between filters and housings; low efficiency filters
<u>Heat exchangers</u>	Dirty heating or cooling coils; excessive water in condensate pans – inadequate drainage from collection pans; blow-through of water droplets onto surfaces downstream of coils; dampness and microbial growth on acoustical lining; poorly maintained air washers or humidifiers; stagnant water in air washers or humidifiers
<u>Supply air plenums and ductwork</u>	Excessive surface deposits; dampness and surface microbial growth; inaccessible humidifiers
<u>Supply air diffusers</u>	Surface deposits, rust, or microbial growth on louvers; soiling of adjacent ceilings and walls; poor air mixing

Occupied Space

Source/Route	Related Factors
<u>Water damage</u>	Evidence or history of plumbing or roof leaks, water intrusion or spills, high indoor humidity (70%), attempts to clean or disinfect carpets and other materials, musty or moldy odors
<u>Chronic condensation</u>	Inadequate insulation or intrusion of humid outdoor air that results in chronic condensation on windows, perimeter walls, or other cool surfaces
<u>Window air conditioners and evaporative air coolers</u>	Location inconvenient for maintenance; dirty grills; standing water in condensate pans or sumps; dampness and surface microbial growth near units
<u>Fan coil and induction units</u>	Dirty heating or cooling coils or filters; excessive water in condensate pans – inadequate drainage from collection pans; dampness and surface microbial growth near units
<u>Carpet</u>	Poorly maintained or water-damaged carpet that serve as sources for dirt accumulation or microbial growth
<u>Fabric office partitions, wall coverings, drapes; upholstered furniture</u>	Poorly maintained or water-damaged fabric-covered and upholstered items that serve as sources for dirt accumulation or microbial growth
<u>Portable (console) humidifiers</u>	Poorly maintained units with microbial growth in the water reservoirs; spray or mist units
<u>Return air plenums</u>	Excessive surface deposits, dampness, and surface microbial growth

Appendix B

SCOTCH TAPE SAMPLING

Equipment needed:

Gloves (latex, vinyl, or nitrile)

Sharp permanent marker pen

Glass microscope slides

Scotch Crystal Clear Tape; #34-8501-9730-1; 1/2 in x 950 in. *It is very important that this type of tape is used!*

Procedure:

When microbial contamination is suspected on a surface, the simplest and most inexpensive method to confirm the presence of microorganisms and identify fungi (molds) to the genus level is by Scotch tape sampling. The sample is shipped to a qualified mycologist for microscopic evaluation. The minimum PPE requirement is the use of gloves. If there is any potential for disturbing the contaminated material, then Tyvek and a 1/2-face respirator with N-95 filters should be worn also.

A piece of Scotch tape 1"-2" long is taken from the dispenser and lightly pressed against the contaminated surface. Ensure that powder from the gloves does not stick to the tape in the area that will be subsequently examined. The tape is then pressed against a clean, lint-free microscope slide. The slide should then be labeled with the date and other sample ID information.

The WISHA Lab is not set up to do microbial identification and slides must be sent to an outside private lab. Slides should be mailed promptly. Contact Policy and Technical Services for assistance in sending slides to outside laboratories for analysis before taking samples.

INDOOR AIR QUALITY (IAQ) **QUESTIONS AND ANSWERS**

INTRODUCTION

Every year, WISHA receives numerous inquiries and complaints from employees and employers alike on the subject of indoor air quality (IAQ) in the workplace. Office buildings and public schools in particular are common sites of indoor air quality problems. Because WISHA has no specific regulations for indoor air quality, we are limited in how we can respond to employer requests for assistance or employee complaints. In most cases, WISHA will not conduct an onsite investigation unless there is sufficient evidence of exposure to a known chemical, gross mold contamination or other evidence of exposure to disease-causing microorganisms. However, there is a wealth of information and guidance available on this subject from EPA and other non-governmental organizations. A number of consulting engineering firms in the state of Washington also specialize in solving IAQ problems. For more specific information on WISHA's response to IAQ problems see the Question and Answer section below.

QUESTIONS AND ANSWERS

1. What is "indoor air quality"?

Indoor air quality or IAQ refers to the quality of air inside buildings where people work or live. Air quality can be a problem when there is inadequate fresh air ventilation, when chemicals are used in the building, when gas furnaces malfunction, when outdoor pollutants enter fresh air intakes, or when mold or other microorganisms grow inside the building or in the heating and ventilation system. The term "indoor air quality" is usually used in reference to non-industrial workplaces, such as office buildings, governmental institutions, hospitals, libraries, and schools.

2. Does the Dept. of Labor & Industries - WISHA have regulations covering indoor air quality?

WISHA does not have specific regulations that address the general topic of indoor air quality. WISHA does have specific regulations that prohibit smoking in offices (see question 12). Other WISHA regulations protect employee from exposures to specific chemicals that can cause ill effects. These regulations specify concentrations of certain chemicals that must not be exceeded and are called "permissible exposure limits" (PELs). However, these permissible exposure limits are usually much higher than levels found in most office buildings or other non-industrial workplaces.

3. How does WISHA handle employee complaints of indoor air quality problems?

Because WISHA has no general indoor air quality regulation, most complaints of this nature are not investigated. Instead, a letter is sent to the employer advising them of complaints and asking them to investigate the situation. Exceptions that would likely initiate an inspection include complaints of carbon monoxide exposure, exposure to high levels of chemicals during their use, or evidence of exposure to life-threatening infectious agents like Legionella (Legionnaire's disease) or Histoplasma (histoplasmosis).

Under certain specific circumstances, an investigation may also be warranted if there is extensive water damage to a building, gross mold contamination and reports of adverse health effects associated with mold exposure. See our WISHA Regional Directive (WRD) 10.10 for more information on this subject.

4. What help will WISHA provide to employers in solving their IAQ problems?

WISHA Consultation staff can provide some limited assistance. This may include sending out information, recommending private IAQ consultants, and in some cases conducting an investigation to look for visible mold contamination or water damage, measuring temperature, humidity, or measuring carbon dioxide levels as an indicator of the amount of fresh air ventilation.

5. Will WISHA conduct air monitoring for an indoor air quality problem when requested?

WISHA will not normally conduct air monitoring for chemicals in indoor air quality problem situations. Past experience in air monitoring has shown that levels of chemicals in the air rarely exceed current WISHA permissible exposure limits. Exceptions include situations where there is evidence of employee exposure to carbon monoxide or high levels of other chemicals being used in the workplace.

Normally, air monitoring for molds or other microorganisms will not be performed because of technical difficulties associated with this type of sampling and the lack of standards for levels of mold or mold spores in the air. Instead, WISHA recommends that ongoing sources of water (roof leaks, leaking pipes) be fixed, mold-contaminated material be removed or cleaned by qualified personnel, or the pathway between the mold source and building occupants be identified and removed or blocked.

6. Will WISHA inspect my heating, ventilation and air conditioning system (HVAC) to see if it is operating properly?

WISHA will not normally inspect HVAC systems since we do not have regulations regarding these ventilation systems. Instead, L & I recommends that qualified HVAC consultants be contacted for assistance. A partial list of HVAC consultants is attached.

7. Where can I get additional information on IAQ problems and how to solve them?

There is a great deal of information and guidance available to assist you in solving IAQ problems. The following internet sites provide general IAQ information:

- EPA Indoor Air Quality homepage at <http://www.epa.gov/iaq/>. This website has several publications and guidelines that can be downloaded or ordered.
- National Institute of Occupational Safety & Health (NIOSH) at <http://www.cdc.gov/niosh/iaqpg> or by calling 1-800-35-NIOSH.
- American Lung Association at <http://www.lungusa.org>.
- *Bioaerosols: Assessment and Control*. A comprehensive 1999 publication on biologically derived airborne contaminants from the American Conference of Governmental Industrial Hygienists. To order a copy, call (513)742-6163 or e-mail: comm@acgih.org.
- American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE) at <http://www.ashrae.org>. This organization publishes technical documents and standards on ventilation and indoor air including the ASHRAE standard 62-1989, *Ventilation for Acceptable Indoor Air Quality*.

The following provide information and guidelines on IAQ in public schools:

- University of Minnesota website on IAQ in public schools at <http://www.dehs.umn.edu/schooliaq>.
- *Healthy Schools*. A newsletter published by the American Federation of Teachers in 1996 and available at <http://www.aft.org/hlthschl.htm>.
- *EPA Tools for Schools*. available on the Environmental Protection Agency IAQ website listed above.
- *School Indoor Air Quality Best Management Practices Manual*. Published by Washington Dept. of Health in 1995 and available at <http://www.doh.wa.gov>.

For hospitals the following document is available:

- *A Guide to Managing Indoor Air Quality in Healthcare Organizations*. Published by the Joint Commission on Accreditation of Healthcare Organizations (JCHAO) in 1998. Cost is \$45. To order call (630) 792-5800 or Fax 1-800-676-3299 (Order code # EC-505LH)

8. What should be done if there is mold contamination at my workplace?

Visible mold contamination should be addressed promptly by either removing contaminated porous material such as rugs, ceiling tiles or sheetrock or thoroughly cleaning contaminated hard surfaces such as ductwork, cooling coils in HVAC systems or drip pans. All investigation and cleanup operations should be conducted in such a manner that investigators, cleanup personnel and building occupants are not exposed to the contaminated material. This may require using gloves, coveralls and respirators during removal and conducting removal work when the building is not occupied and the HVAC system is shut down.

Since mold cannot grow without moisture, all sources of moisture or water leaks must be stopped or repaired, to prevent contamination from re-occurring. For more information on handling mold contamination problems go to the website at <http://www.envirovillage.com/Papers>.

9. Does WISHA have any requirements for temperature control in offices?

WISHA does not have regulations on temperature in offices. We may conduct an investigation in workplaces where heat stress (heat exhaustion or heat stroke) has occurred or is a possibility. This typically will occur only when temperatures are sustained above 90 degrees F. and employees are physically active on their job. In these cases, heat stress measurements can be taken with special instruments. If specified levels are exceeded, WISHA may require that the employer take remedial measures. Similarly, employee exposure to cold temperatures below freezing may also require remedial measures.

10. Should I be concerned about strong odors from hot tar roofing on my building or a nearby building?

While hot tar operations can be smelly and even cause adverse symptoms in some people, the permissible limits are rarely exceeded in offices or workplaces inside the building. For this reason, WISHA cannot usually direct a tarring crew to cease operations. However, because fresh air intakes are often on the roof or downwind of the tarring operation, the odors and fumes can be drawn into the building and affect sensitive individuals. The best solution is to have the tarring operation done during non-business hours. Another less effective measure would be to temporarily close down or block the affected fresh air intakes.

11. What should be done during remodeling or construction in my building?

Remodeling or construction conducted in a building while occupied by office workers can sometimes expose them to significant amounts of dust, noise and chemicals. The operation should be isolated as much as possible from office workers with temporary barriers. In some cases exhaust ventilation will be needed in the construction area to remove dust or chemical vapors. Alternatively, remodeling and construction can be done after hours or on weekends. Occasionally these operations can expose office workers to levels of contaminants above their permissible exposure limits. In these cases, if WISHA is asked to investigate either by an employee complaint or by a request from management, we may require that measures be implemented to reduce employee exposures.

12. The new carpet in my office has a strong odor. Is it a health hazard?

While some new carpets can smell strongly after installation, they do not emit gases or vapors that exceed permissible exposure limits. Some sensitive people however, may be temporarily affected by the odors. Generally, the odors diminish within a few days or weeks. If time allows, the carpet can be installed several days prior to occupancy and maximum fresh air ventilation be provided to reduce odors when employees occupy the building or room. Low-odor carpets can also be purchased from some manufacturers.

For more information on carpets and carpet adhesives related to indoor air quality, see the Carpet and Rug Institute webpage at <http://www.carpet-rug.com/atwork/default.htm>.

13. What can I do about airborne contaminants coming into my building or office from other businesses in my building or adjacent to my building?

The first step is to express your concerns to the manager of the business generating the contaminants or the building manager or owner. If the company or building owner fails to take action, you can call the local air pollution authority and ask for their investigation. If an employee files a complaint with WISHA, an inspector may inspect both your business and the adjacent business and may require either or both to control their employee exposures to tobacco smoke or chemicals that exceed permissible exposure limits. In some instances, a building owner directly in control of activities in the building may be required to control exposures to building occupants. If an employer asks for assistance from a WISHA consultant, the consultant may also recommend a course of action to as needed to control employee exposures. However, if permissible exposure limits are not exceeded, WISHA cannot compel an employer, adjacent business or building owner or manager to stop or change their activities.

14. Is smoking allowed in workplaces?

WISHA has specific regulations (WAC 296-62-12000) which prohibits smoking in offices or office buildings except in specially ventilated rooms. WISHA has no regulations that limit or prohibit smoking in workplaces other than offices.

15. What training on IAQ is available?

Washington State University – Cooperative Extension Energy Program offers short courses on indoor air quality. A schedule of training courses can be found on the internet at <http://www.energy.wsu.edu/educate/trainsc9>.

If you have specific questions regarding WISHA and indoor air quality, you can contact WISHA industrial hygienists by phone at our Labor & Industries regional offices listed in the telephone directory under "Washington, State of".

Private Indoor Air Quality Consulting Companies

The following is a partial list of IAQ consultants in Washington state who can conduct in-depth investigations into indoor air quality problems you may be having at your place of business or worksite. This list is provided for informational purposes only and does not imply preference, approval, endorsement or accreditation by the Department of Labor & Industries.

- 1. Blue Sky Testing Laboratories**
8655 39th S.
Seattle, WA 98118
(206) 7212583
- 2. Clayton Environmental Consultants**
4636 Marginal Way So. Suite 215
Seattle WA. 98134
(206) 763-7364
- 3. Healthy Buildings Associates**
1932 1st Ave, Suite 515
Seattle, WA
(206) 448-9135
- 4. EHS International Inc.**
9 Lake Bellevue Bldg. Suite 203
Bellevue, WA 98005
(425) 455-2959
- 5. Envirometrics Inc.**
4803 Fremont N.
Seattle, WA 98103
(206) 633-4456
- 6. Envirotech Research Inc.**
9600 Stone N.
Seattle, WA 98103
(206) 522-5449
- 7. Healthy Habitats**
P.O. Box 7472
Olympia, WA 98507
(360) 357-6443
- 8. The Lambert Group**
1817 Springfield Av.
Spokane, WA
(509) 536-9676
- 9. Nowicki & Associates**
33516 9th Ave. S
Federal Way, WA 98003
(253) 927-5233
- 10. Prezant Associates Inc.**
330 6th Ave North, Suite 200
Seattle, WA 98109
(206) 281-8858
- 11. Schumacher & Associates**
2200 6th Ave. Suite 250
Seattle, WA 98121
(206) 443-4276